

Claims:

1. An isolated human postnatal deciduous dental pulp multipotent stem cell.
2. The stem cell of claim 1, wherein the stem cell can differentiate into a neural cell, an adipocyte, or an odontoblast.
3. The stem cell of claim 1, wherein the stem cell can express STRO-1, CD146, ALP, matrix extracellular phosphoglycoprotein LF155, basic fibroblast growth factor, endostatin, or any combination thereof.
4. The stem cell of claim 1, wherein the stem cell can express CBFA1, ALP, MEPE, BSP, DSPP, or any combination thereof following mineralizing induction.
5. The stem cell of claim 1, wherein the stem cell can express CBFA1, Osterix, Osteocalcin, or any combination thereof following induction with BMP-4.
6. The stem cell of claim 1, wherein the stem cell can express nestin, β III-tubulin, glutamic acid decarboxylase, neuronal nuclei, glial fibrillary acidic protein, neurofilament M, 2',3'-cyclic nucleotide-3'-phosphodiesterase, or any combination thereof following neural induction.
7. A method to generate bone in an organism comprising implanting at least one human postnatal deciduous dental pulp multipotent stem cell into the organism.
8. The method of claim 7, wherein the stem cell is implanted after mineralizing induction or induction with BMP-4.
9. The method of claim 7, wherein the stem cell induces a recipient cell to produce bone.

10. The method of claim 9, wherein the recipient cell is an osteoblast or an osteocyte.
11. The method of claim 7, wherein the stem cell is implanted to reduce or ameliorate trauma within the organism.
12. The method of claim 11, wherein the trauma is a bone degenerative disease.
13. The method of claim 12, wherein the bone degenerative disease is osteoporosis.
14. The method of claim 11, wherein the trauma is a physical injury.
15. The method of claim 14, wherein the physical injury is due to joint replacement, hip replacement, or root canal.
16. A method to produce human neural tissue comprising implanting at least one dental stem cell into an organism.
17. The method of claim 4, wherein the dental stem cell is a dental pulp stem cell or a human postnatal deciduous dental pulp multipotent stem cell.
18. The method of claim 16, wherein the dental stem cell is implanted following neural induction.
19. The method of claim 16, wherein the dental stem cell is implanted into neural tissue contained within the organism.
20. The method of claim 16, wherein the dental stem cell is implanted to reduce or ameliorate neural trauma within the organism.
21. The method of claim 20, wherein the neural trauma is a neural degenerative disease.

22. The method of claim 21, wherein the neural degenerative disease is Alzheimer's disease or Parkinson's disease.
23. The method of claim 21, wherein the neural trauma is a physical injury.
24. A method to produce human adipose tissue comprising implanting at least one dental stem cell into an organism.
25. The method of claim 24, wherein the dental stem cell is a dental pulp stem cell or a human postnatal deciduous dental pulp multipotent stem cell.
26. The method of claim 24, wherein the dental stem cell is implanted following adipocyte induction.
27. A method to generate dentin comprising implanting a human postnatal deciduous dental pulp multipotent stem cell into an organism.
28. A method to generate dentin comprising
- a. contacting pre-existing dentin with a dental stem cell, and
 - b. incubating the pre-existing dentin and the dental stem cell.
29. The method of claim 28, wherein the dental stem cell is a dental pulp stem cell or a human postnatal deciduous dental pulp multipotent stem cell.
30. The method of claim 28, wherein the pre-existing dentin is contacted with the dental stem cell in vivo or in vitro.
31. The method of claim 28, wherein the pre-existing dentin is contained within a tooth.

32. The method of claim 28, wherein the pre-existing dentin is human pre-existing dentin.
33. The method of claim 28, further comprising contacting the pre-existing dentin with a formulation to produce treated dentin.
34. The method of claim 33, further comprising washing the treated dentin with a fluid.
35. The method of claim 34, wherein the fluid is water, a biological solvent, or a biological buffer.
36. The method of claim 33, wherein the formulation is an acid solution.
37. The method of claim 36, wherein the acid is selected from the group consisting of acetic acid, phosphoric acid, formic acid, sulfuric acid, hydrochloric acid, hydrofluoric acid, hydroiodic acid, nitric acid, or hydrobromic acid.
38. The method of claim 37, wherein the acid solution has a concentration of between 0.01 % and 100 % acid.
39. The method of claim 37, wherein the acid solution has a concentration of between 1 % and 10 % acid.
40. The method of claim 37, wherein the acid solution has a concentration of between 1 % and 5 % acid.
41. The method of claim 37, wherein the acid solution has a concentration of between 0.5 % and 2 % acid.
42. The method of claim 33, wherein the formulation is a base solution.

43. The method of claim 42, wherein the base solution comprises a base selected from the group consisting of sodium hydroxide, potassium hydroxide, or ammonium hydroxide.

44. The method of claim 42, wherein the base solution has a concentration of between 0.01 % and 100 % base.

45. The method of claim 42, wherein the base solution has a concentration of between 1 % and 10 % base.

46. The method of claim 42, wherein the base solution has a concentration of between 1 % and 5 % base.

47. The method of claim 42, wherein the base solution has a concentration of between 0.5 % and 2 % base.

48. The method of claim 28, wherein dentin is generated in response to trauma to the tooth.

49. The method of claim 48, wherein the trauma is a root canal.

50. The method according to any one of claims 7, 16, 24, or 27, wherein the organism is a mammal.

51. The method according to claim 50, wherein the mammal is a human.

52. The method according to any one of claims 7 or 27, wherein the stem cell is expanded ex vivo.

53. The method according to any one of claims 16, 24, or 28, wherein the dental stem cell is expanded ex vivo.

54. The method according to any one of claims 7 or 27, wherein the stem cell is implanted in combination with a carrier.
55. The method according to any one of claims 16, 24, or 28, wherein the dental stem cell is implanted in combination with a carrier.
56. The method according to any one of claims 54 or 55, wherein the carrier comprises hydroxyapatite, tricalcium phosphate, or hydroxyapatite and tricalcium phosphate.
57. A cell according to claim 1, wherein the cell is transfected with a nucleic acid segment.
58. A non-human mammal comprising a cell according to any one of claims 1 or 57.